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# **NTCRAs Submunitions Area Controlled Burn/Remote Equipment Surface Clearance & Cayo La Chiva Underwater MEC Removal Vieques, PR**

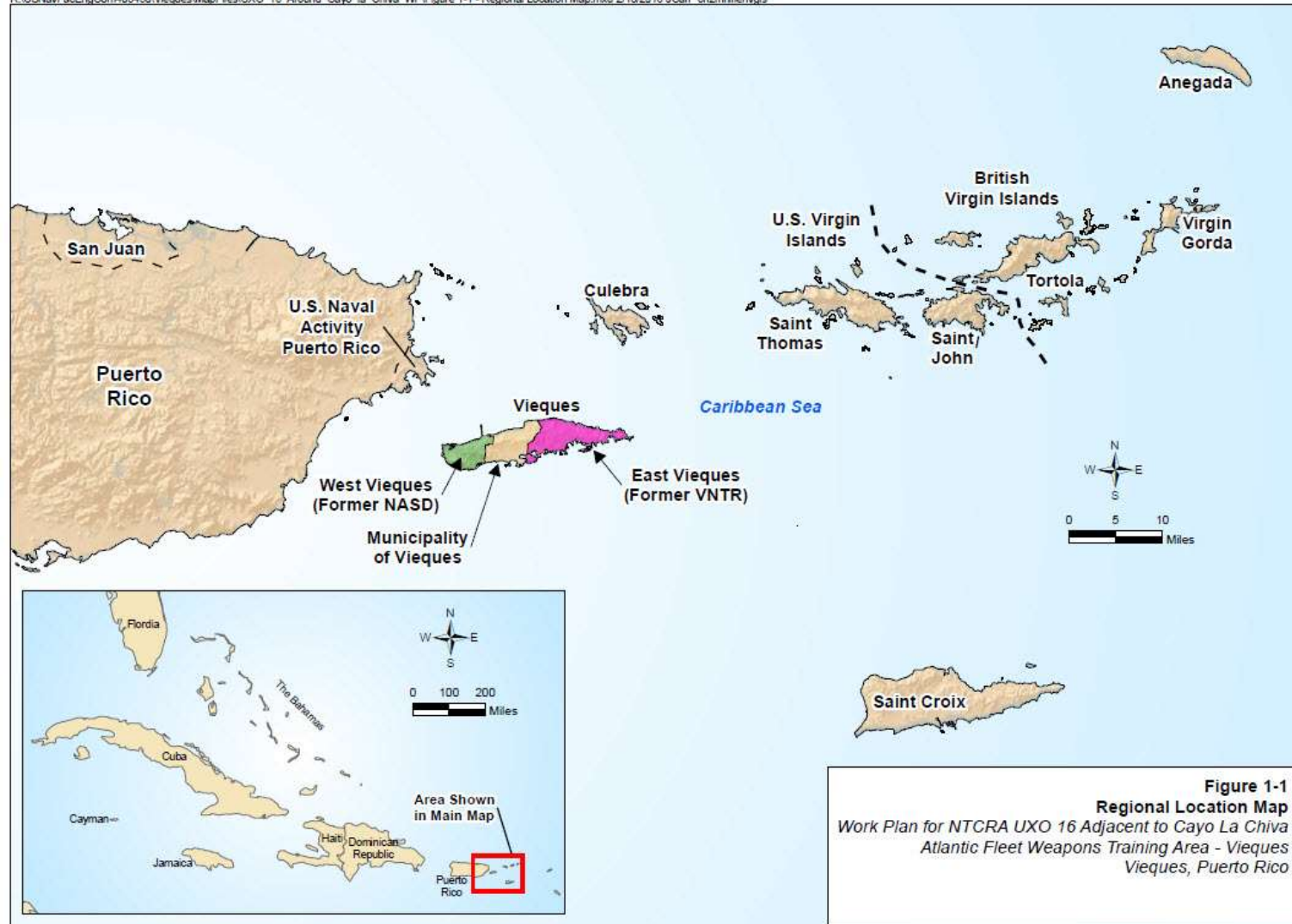
**Presented By  
Daniel Hood**  
Naval Facilities Engineering Command (NAVFAC)  
Atlantic

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# Vieques Location Map



R:\USNavFacEngCom\405450\Vieques\MapFiles\UXO 16 Around Cayo la Chiva WP\Figure 1-1 - Regional Location Map.mxd 2/18/2016 JCarr: ch2mhillenvglis



# Objectives



- **Overview of two major milestone Removal Actions on the Vieques Project**
  - **NTCRA for the Surface Clearance of the Submunitions Area**
    - Controlled Burn with Air monitoring
    - Remote Equipment utilization
    - Final Surface Clearance
  - **NTCRA UXO 16 Adjacent to Cayo La Chiva**
    - Biological Work
    - MEC removal and disposal
- **Lessons Learned**

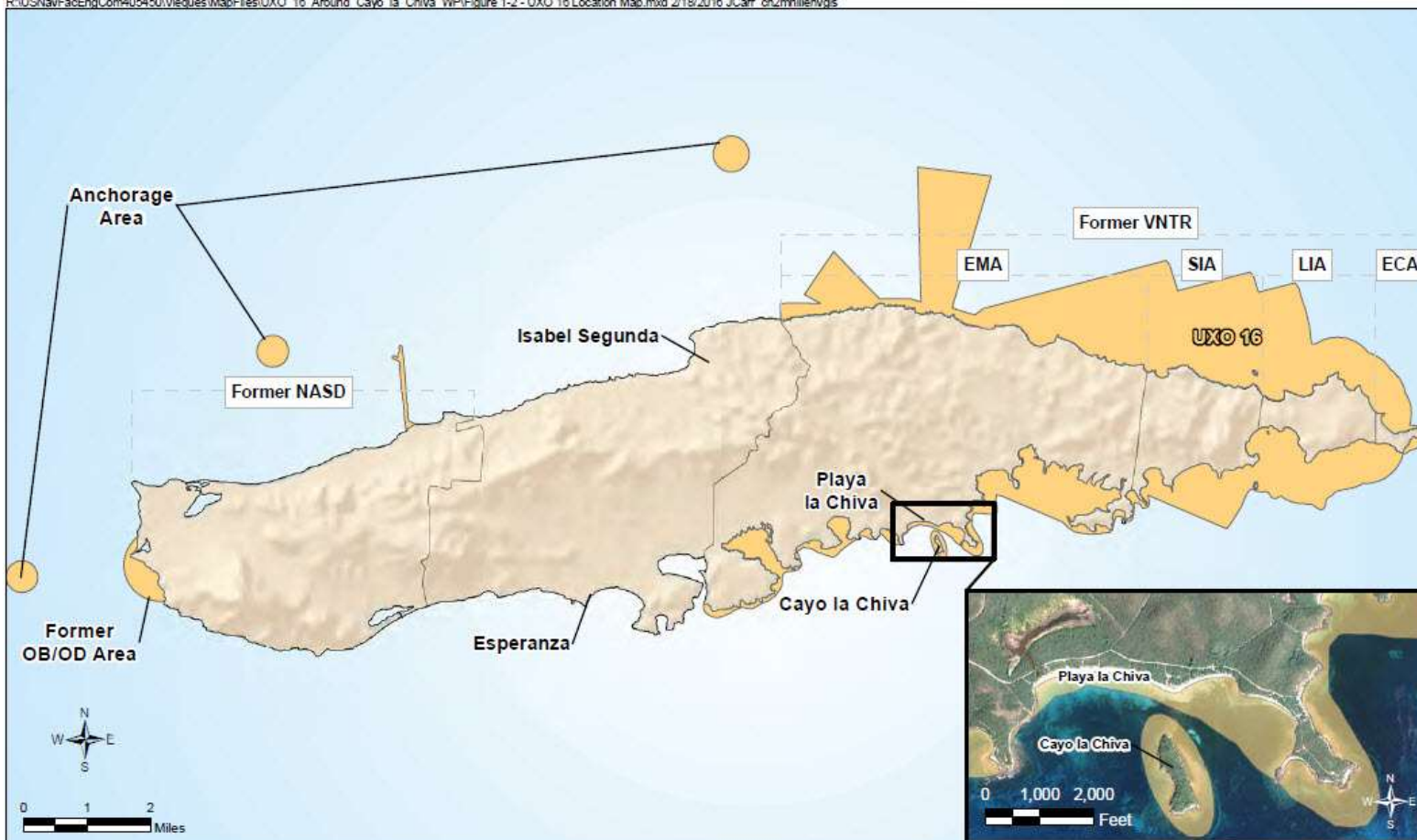


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# Cayo La Chiva NTCRA



R:\USNavFacEngCom\405450\ Vieques\MapFiles\UXO 16 Around Cayo la Chiva WP\Figure 1-2 - UXO 16 Location Map.mxd 2/18/2016 JCarr\_ch2mhillengvis



**Legend**  
 ■ UXO 16  
 ECA - Eastern Conservation Area  
 EMA - Eastern Maneuver Area  
 LIA - Live Impact Area  
 SIA - Surface Impact Area  
 NASD - Naval Ammunition Support Detachment  
 VNTR - Vieques Naval Training Range

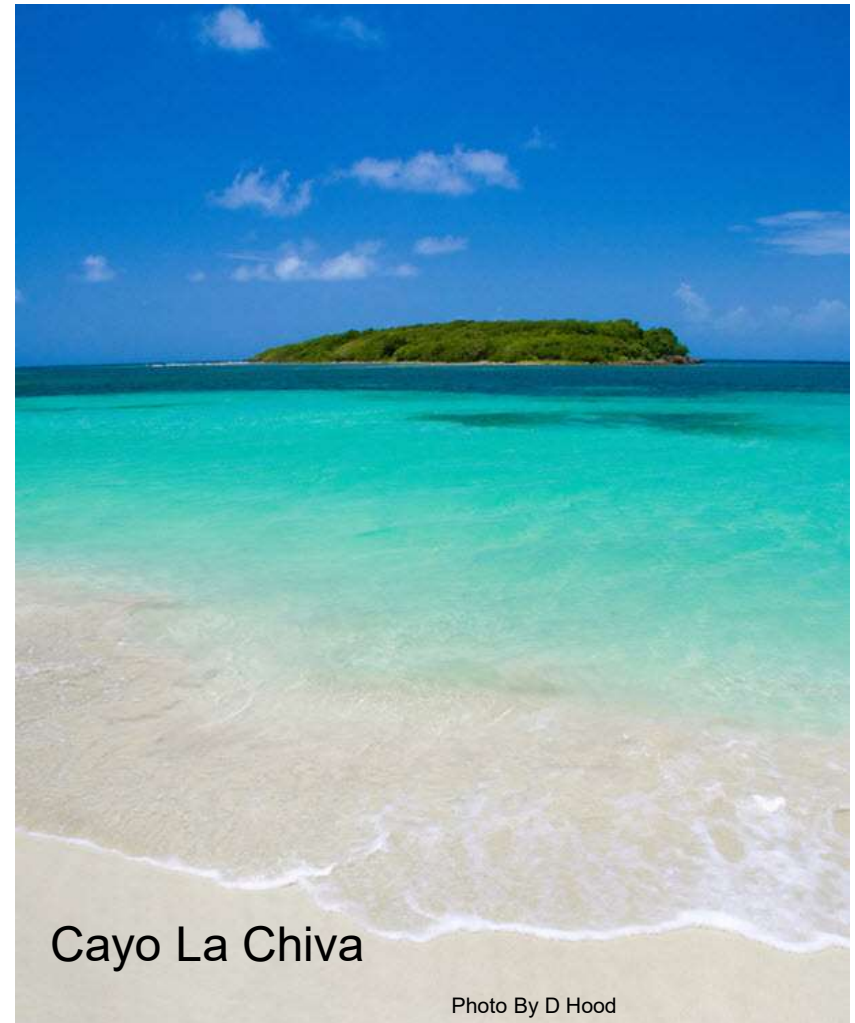
**Figure 1-2**  
**UXO 16 Location Map**  
 Work Plan for NTCRA UXO 16 Adjacent to Cayo La Chiva  
 Atlantic Fleet Weapons Training Area - Vieques  
 Vieques, Puerto Rico

# History



- **2010 Munitions items found adjacent to Blue Beach (a public beach)**
- **Navy EOD Team Conducted a visual inspection of the waters near Blue Beach and Cayo La Chiva**
  - Identified 9 possible MEC items
- **2011 Site Inspection of Cayo La Chiva**
  - Identified 5 five inch rockets
  - Several Smoke canisters
  - Conducted Demo on island
  - Installed LUC
    - Signs at all public access points
    - Signs on Cayo La Chiva
    - Buoys around Cayo La Chiva

**Initiated an Investigation of Blue Beach**





# NTCRA Activities



- Conducted from June 19 through 23, 2017
- Team included:
  - Munitions Response divers to locate, excavate, identify, and properly handle items recovered
  - Scientific divers to ensure threatened corals and other sensitive species/habitats were avoided
  - Full-time security boat to maintain exclusion zones from recreational boaters and swimmers
  - Support boat for regulatory oversight
  - Playa La Chiva was closed during operations

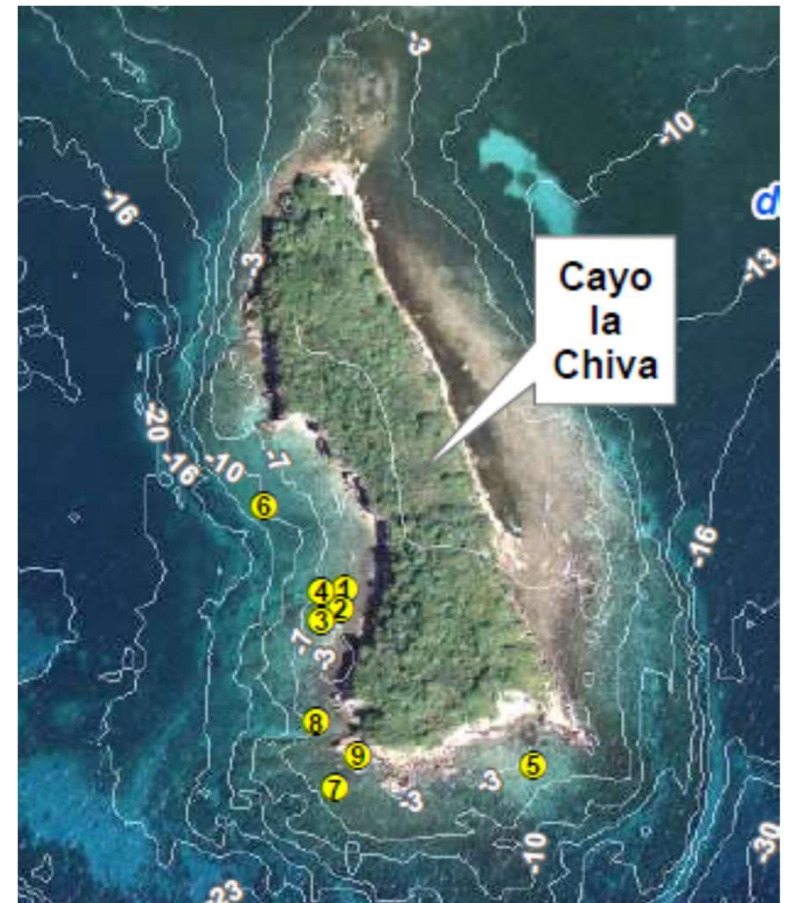


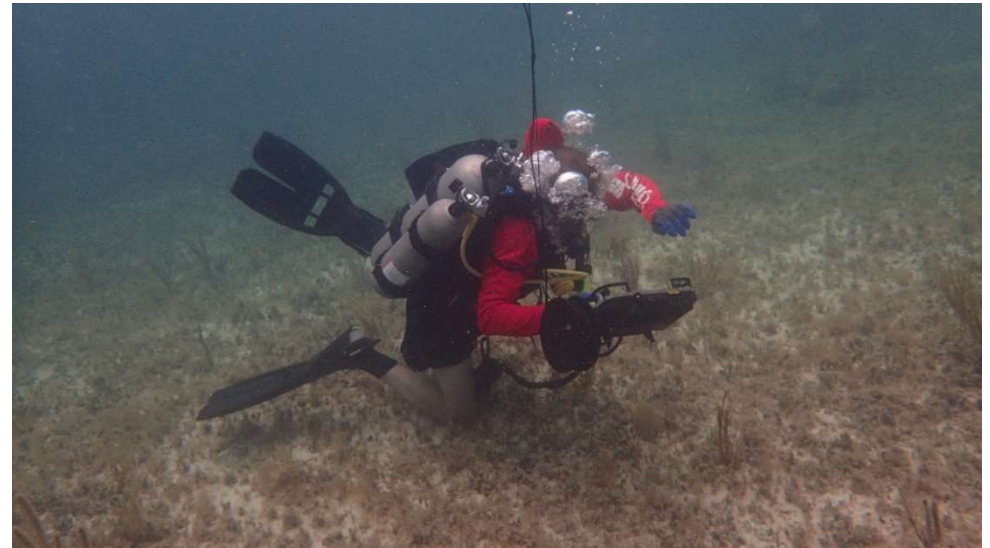
Photo by CH2MHILL

# Dive Operations



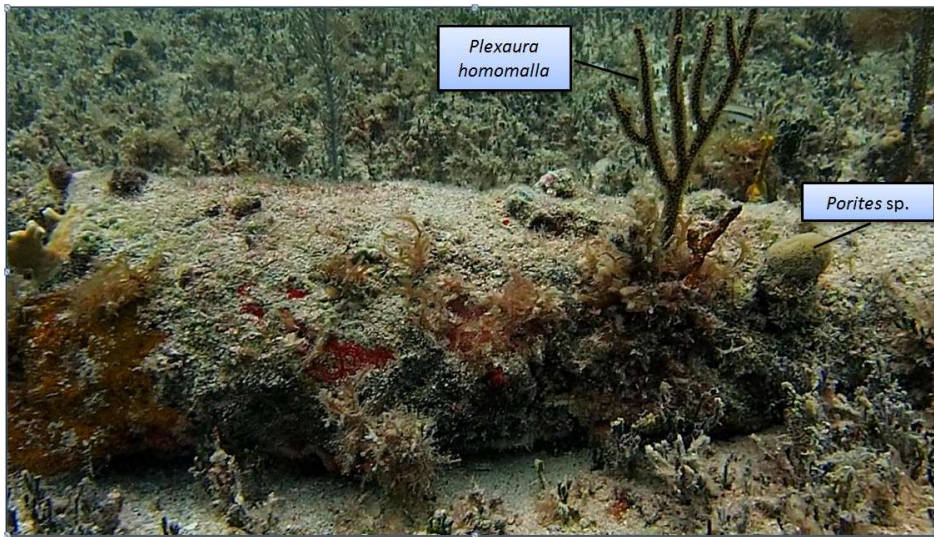
**Pre-Dive Operations:  
Safety Brief**

**Target Location:  
Utilizing Underwater  
Navigation System**

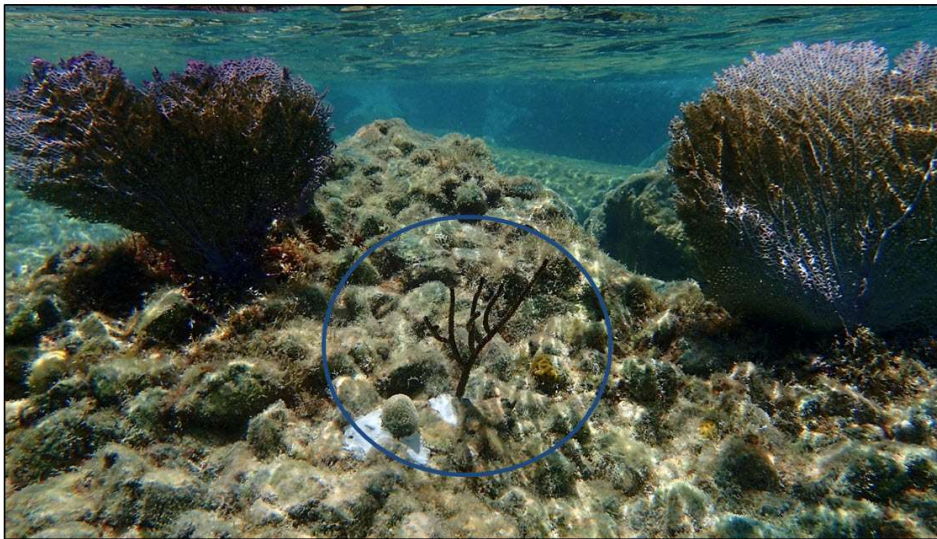




# Biological Work



- **Pre Removal Biological Survey:**
  - Identify Protected Coral Species and Non Protected Corals that will be affected
- **During the Removal:**
  - Monitor Protected Species
  - Relocate all Corals



Photos by CH2MHILL



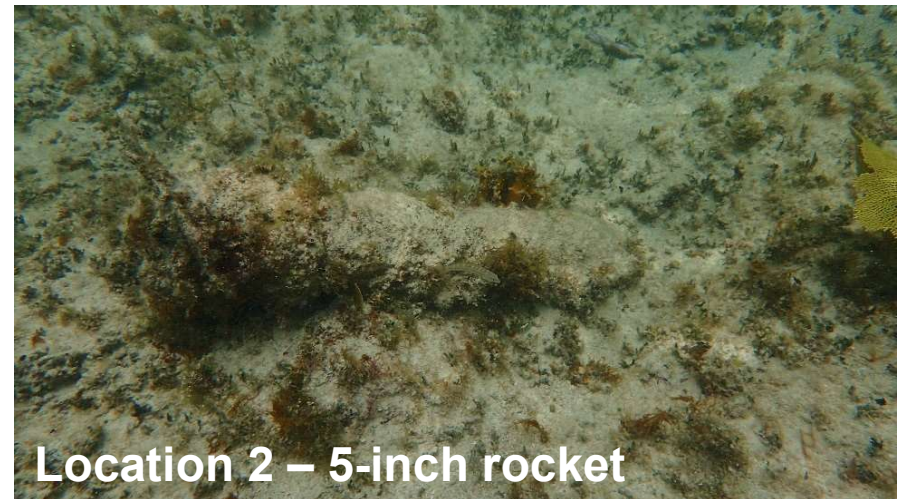
# Recovery Operations



# Findings



- **Location 1 – Cylindrical rock**
- **Location 2 – 5-inch rocket**
  - Two ESA-listed corals found within 5 and 10 ft
- **Location 3 – 5-inch rocket**
  - Three ESA-listed corals found within 6, 10, and 15 ft
- **Location 4 – Cylindrical rock**
- **Location 5 – Rock**
- **Location 6 – MD fragment**
- **Location 7 – 5-inch rocket**
- **Location 8 – 5-inch rocket**
- **Location 9 – 5-inch rocket**





# Classification of Items



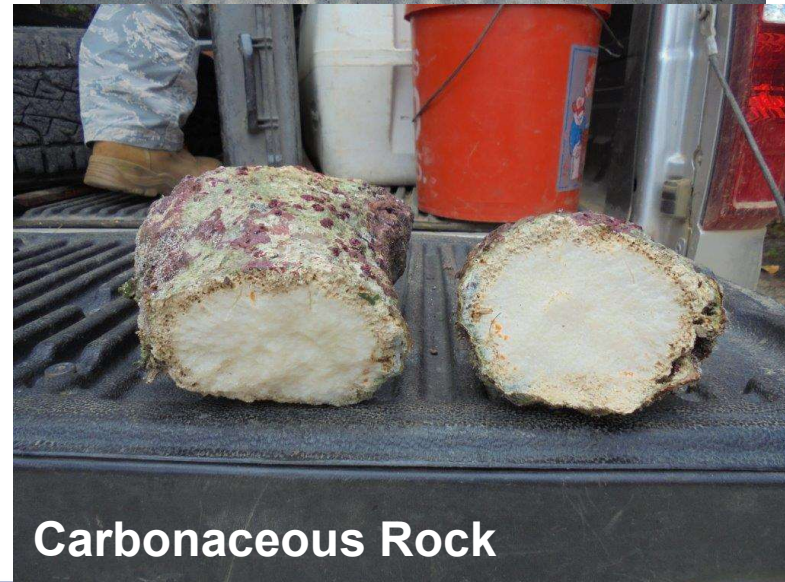
**5-inch Rocket**



**Rocks Recovered**



**Carbonaceous Rock**





# Demolition



- Items Appeared to be empty due to large visible rust holes.
- Attempted to perforate items to visibly inspect.



# Demolition

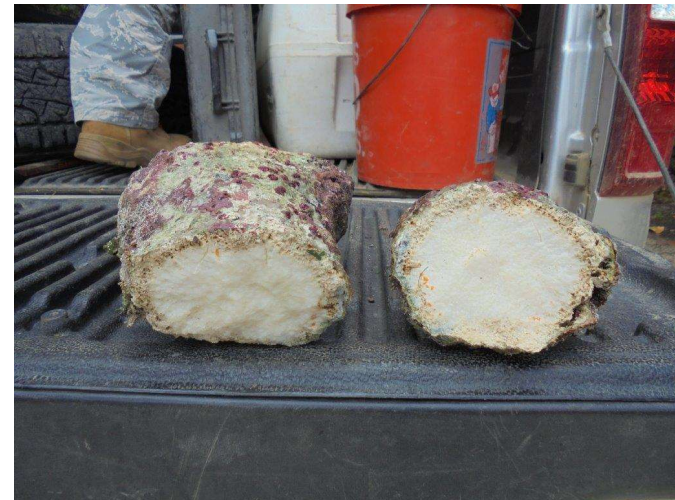




# Lessons Learned/Summary



- **Just because it looks like a rocket doesn't mean it is a rocket.**
  - Never conduct just a visual underwater survey
  - Once you identify an item as MEC underwater it is very hard to convince the regulators otherwise.
- **EVEN THE EXPERTS CAN BE WRONG!**
- **All underwater work is at the Mercy of Mother Nature.**



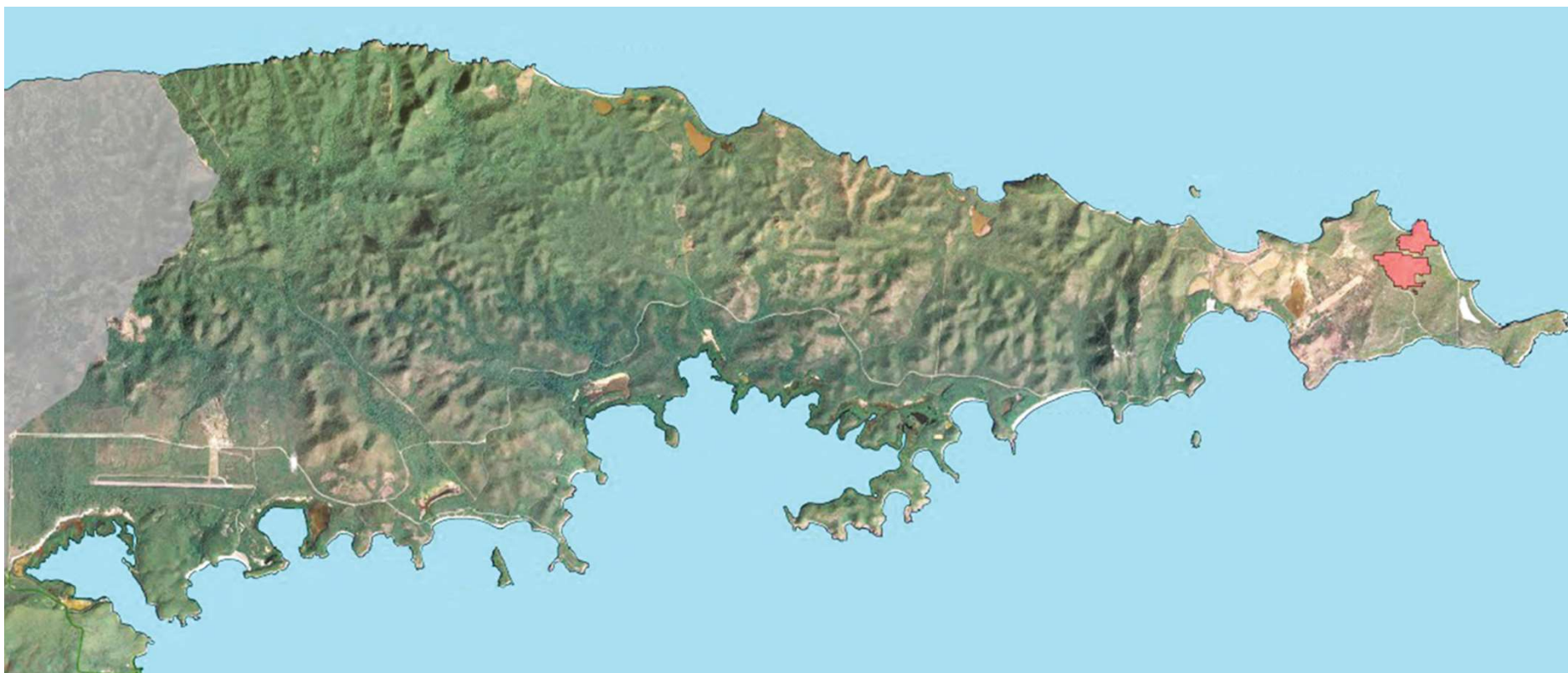




# **UXO 4 Submunitions Area TCRA Update**

**Vieques Technical  
Subcommittee Meeting  
February 28, 2017**

# Submunitions Area



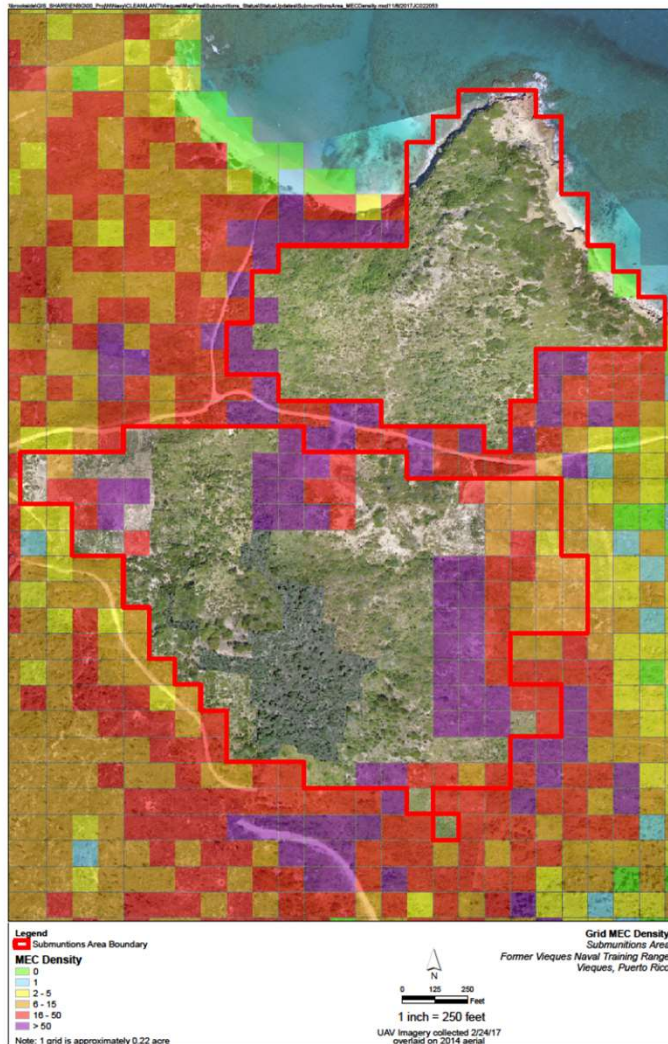


# Munitions Identified in Submunitions Area





# History



- 75 acres of the highest density area remain
- Mixed munitions types
- Rough Terrain
- Thick vegetation
- Controlled Burn (tested) Variance?
- Remote Removal tested
- Public Opinion

# NTCRA Removal Process



## ▪ Step One

- Remote cutting of vegetation
  - Could not hand cut due to safety
  - Cutting required to burn

## ▪ Step Two

- Remote Removal of Bombs
  - Equipment capable of moving MEC (from 20 mm to 2,000 lb bombs)
  - Personnel located outside of fragmentation arcs
  - No manual handling of MEC or equipment for securing MEC
  - Large Item Demo conducted





# NTCRA Removal Process



## ■ Step Three: Remote Raking

- Raking the vegetation into piles
  - Increases Safety
  - Reduces size of burn
  - Physical destruction of submunitions



## ■ Step Four: Remote Burning

- Remote Burning
  - Fire started remotely
  - Eliminates vegetation handling
  - Sympathetic Detonations



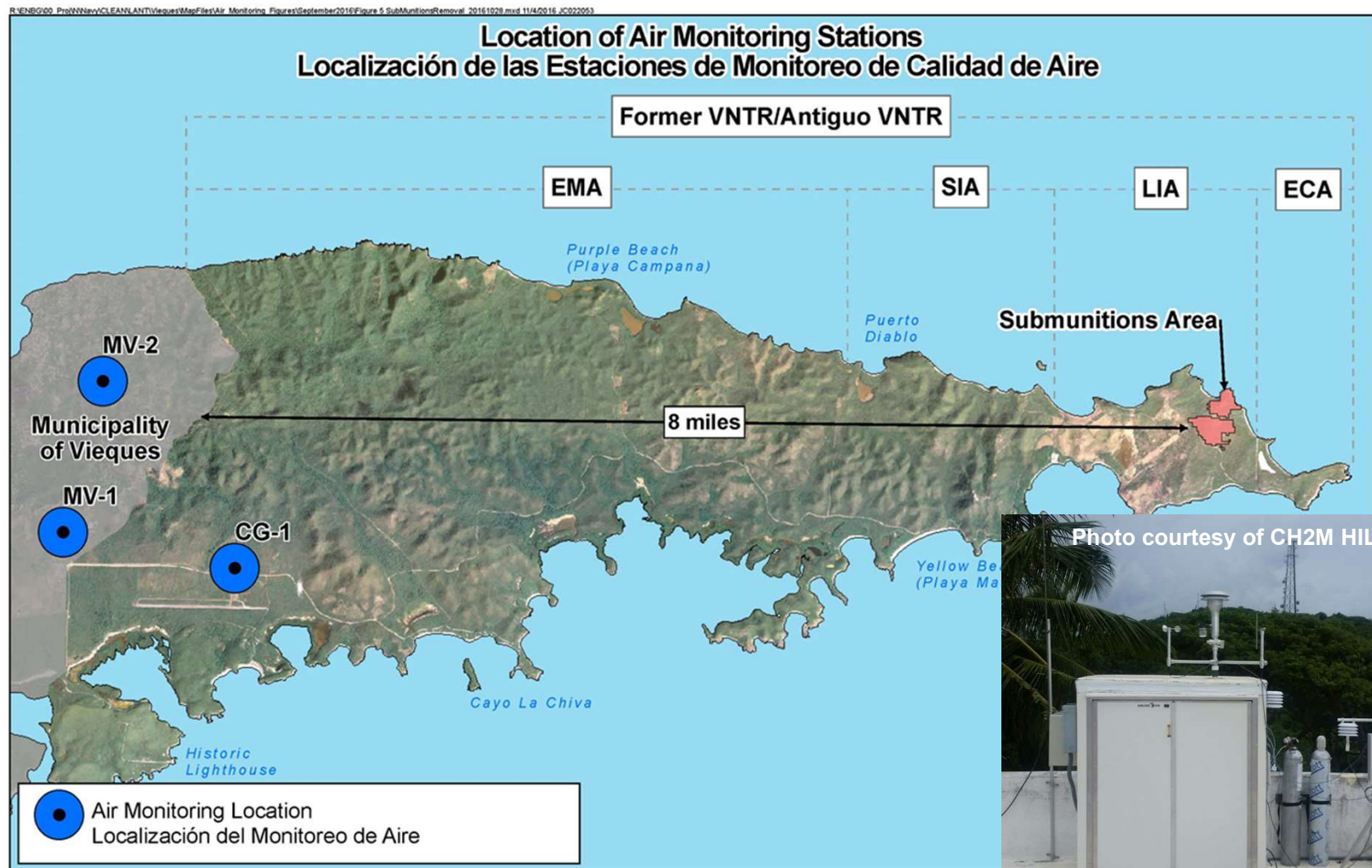
# October, 2017 Burn



Video courtesy of CH2M HILL



# Air Monitoring Locations



# Air Monitoring Constituents



- **Particulate matter**

- **PM<sub>10</sub>** (particulate matter 10 microns or smaller in size)
- **PM<sub>2.5</sub>** (particulate matter 2.5 microns or smaller in size)

- **Carbon monoxide**

- **Explosives**

HMX	Nitrobenzene	1,3,5-Trinitrobenzene	2,6-Dinitrotoluene
RDX	1,3-Nitrobenzene	2,4-Dinitrotoluene	2,4,6-Trinitrotoluene

- **Metals**

Arsenic	Copper	Iron	Mercury	Phosphorus
Cadmium	Chromium	Lead	Nickel	Tin



# NTCRA Removal Process



- **Step Five**
  - MEC Surface Clearance
  - QA
- **Step Six**
  - DEMO
- **Step Seven**
  - Final Surface
  - QA



# 5 Events Cycles



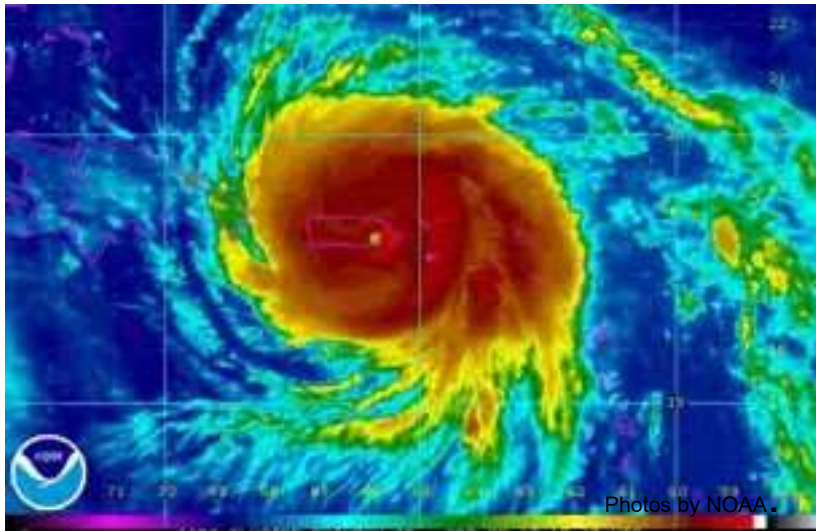
- **Five controlled burns to date**
  - January 2015, October 2016, November 2016, March 2017, June 2017
    - Hurricane Maria Delay
  - 17 acres cleared of the 75
  - 5,949 MEC items
  - 4,250 Submunitions
  - NO Air monitoring exceedances
- **18,165 submunitions have been removed from the LIA**



# Lessons Learned/Summary



- **Flexibility is the Key**
  - All plans change
  - Fire does what it wants
  - Mother Nature!!!
- **Remote does not equal Fast**
  - Cycle time



# Knowledge Check



- **Please take 10 minutes to complete a 250 character summary of my presentation to be graded at Happy Hour!**
  - **Paper and pencil are available in your hotel room.**

## **Key Topics to include:**

- What types of Plans are needed prior to conducting a Dive?
- Are Endangered Species important?
- Are the experts always correct?
- Should we be flexible on removals?
- Is safety important?
- Is remote controlled equipment cheap?
- Is Mother Nature Predictable?
- Who should you call if you need MEC technical assistance?



Photos courtesy of Jim Brantley LANT PAO



# NAVFAC Atlantic

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